U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Geranium hanaense*

COMMON NAME: Nohoanu

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: March 2007

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X__ Continuing candidate
___ Non-petitioned
_X__ Petitioned - Date petition received: May 11, 2004
_ 90-day positive - FR date:
X 12-month warranted but precluded - FR date: May 11, 2005
N Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)? Yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, since publication of the last CNOR, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs) because most of our national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations, and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken, see the discussion of "Progress on Revising the Lists" in the current CNOR, which can be viewed on our Internet website (http://www.fws.gov/endangered).

_X__ Listing priority change
Former LP: _5__

New LP: _8__

Date when the species first became a Candidate (as currently defined): October 25, 1999

___ Candidate removal: Former LP: ___

___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering plants, Geraniaceae (Geranium family)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, island of Maui

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, island of Maui

LAND OWNERSHIP: *Geranium hanaense* occurs on Federal land in Haleakala National Park.

LEAD REGION CONTACT: Scott McCarthy, (503) 231-6131, Scott McCarthy@fws.gov

LEAD FIELD OFFICE CONTACT: Pacific Islands Fish and Wildlife Office, Christa Russell, (808) 792-9400, christa_russell@fws.gov

BIOLOGICAL INFORMATION

Species Description

Geranium hanaense is a decumbent shrub 1 to 1.6 feet (0.3 to 0.5 meters) tall, stems are dark reddish brown, often rooting at the nodes, sparingly branched, and leafy only toward the apex. Leaves are alternate, oblong-obovate to oblong-elliptic, 0.6 to 2 inches (in) 1.5 to 5 centimeters (cm) long, 0.3 to 0.8 in (0.8 to 2 cm) wide, with the upper and lower surfaces densely silky strigose. Flowers are three to six in compound cymes. Petals are white and streaked with purple or purplish magenta. Seeds are presumably one per cell (Wagner *et al*. 1999a).

Taxonomy

Geranium hanaense was described by Medeiros and St. John (1988). This species is recognized as a distinct taxon in the *Manual of Flowering Plants of Hawaii* (Wagner *et al*. 1999a), the most

recently accepted Hawaiian plant taxonomy.

Habitat/Life History

Geranium hanaense forms large patches in bogs at elevations between 5,413 and 5,479 feet (1,650 and 1,670 meters) (Wagner *et al*. 1999a). The bogs are dominated by the native species *Carex echinata* (no common name (NCN)) and *Oreobolus furcatus* (NCN), with smaller stands of *Carex alligata* (NCN) (Hawaii Biodiversity and Mapping Program (HBMP) 2006a). Other associated native species include *Argyroxiphium grayanum* (greensword), *Deschampsia nubigena* (hairgrass), *Plantago pachyphylla* (laukahi kuahiwi), *Leptecophylla tameiameiae* (pukiawe), *Vaccinium* spp. (ohelo), and *Viola maviensis* (pamakani) (Medeiros and St. John 1988).

Historical Range

Geranium hanaense was first described by Medeiros and St. John (1988), occurring in two adjacent montane bogs on the northeast rift of Haleakala, east Maui.

Current Range/Distribution

Currently, *Geranium hanaense* is found in the same two adjacent bogs on the northeast rift of Haleakala, in Haleakala National Park (HBMP 2006a).

Population Estimates/Status

In 1988, *Geranium hanaense* was represented by 500 to 700 individuals occurring in two adjacent bogs, Big Bog and Mid-Camp Bog, in Haleakala National Park (Medeiros and St. John 1988). Since then, the number of individuals has declined, and only 300 to 500 individuals remain (K. Wood, National Tropical Botanical Garden, pers. comm. 2005).

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range. This species is threatened by feral pigs (*Sus scrofa*) that degrade and destroy habitat (Medeiros *et al*. 1991; Medeiros and St. John 1988; HBMP 2006a). Evidence of the activities of feral pigs was reported in the northeast bogs area of Haleakala National Park in the early 1970s, and increased activity in the 1980s was found to cause loss of native plant cover and invasion by alien plant species (Medeiros *et al*. 1991).

Pigs of Asian ancestry were introduced to Hawaii by the Polynesians, and the Eurasian type was introduced to Hawaii by Cook in 1778, with many other introductions thereafter (Tomich 1986). Some pigs raised as food escaped into the forests of Hawaii, Kauai, Oahu, Molokai, Maui, and Niihau, formed herds, and are now managed as a game animal by the State to optimize hunting opportunities (Tomich 1986; State of Hawaii 2001). A study was conducted in the 1980s on feral pig populations in the Kipahulu Valley on Maui (Diong 1982). This valley consists of a diverse composition of native ecosystems, from near sea level to alpine, and forest types ranging from mesic to wet, *Acacia koa* (koa) to *Metrosideros polymorpha* (ohia). Rooting by feral pigs was observed to be related to the search for earthworms, with rooting depths averaging 8 inches (20 centimeters), greatly disrupting the leaf litter and topsoil layers, contributing to erosion and

changes in ground topography. The feeding habits of pigs created seed beds, enabling the establishment and spread of weedy species such as *Psidium cattleianum* (strawberry guava). The study concluded that all aspects of the food habits of pigs are damaging to the structure and function of the Hawaiian forest ecosystem (Diong 1982). A study conducted over six years in the bog habitat on eastern Haleakala showed that portions of the bogs dominated by *Carex echinata* were more readily invaded by alien plant species after repeated disturbance by feral pigs (Medeiros *et al*. 1991). This study area, which includes Big Bog and Mid-Camp Bog, provides the only known habitat for *Geranium hanaense* (Medeiros *et al*. 1991). A parallel study included Greensword Bog (just west of Big Bog and Mid-Camp Bog), which had been so damaged by feral pigs that only bare ground remained (Loope *et al*. 1991). A perimeter fence was constructed in 1981 around Greensword Bog, and monitoring thereafter showed that the cover of native plant species increased to 95% within six years of fencing (Loope *et al*.1991). This study also showed that feral pig damage to the vegetation of a Hawaiian bog is largely reversible.

Because of demonstrated habitat modifications by feral pigs, such as destruction of native plants, disruption of topsoil leading to erosion, and establishment and spread of nonnative plants, the U.S. Fish and Wildlife Service (Service) believes they are a threat to *Geranium hanaense*.

B. Overutilization for commercial, recreational, scientific, or educational purposes.
None known.

C. Disease or predation.
Predation by feral pigs is a likely threat to *Geranium hanaense* (Loope *et al*. 1991). In a study conducted in the 1980s, pigs were observed browsing on young shoots, leaves, and fronds of a wide variety of plants, of which over 85 percent were endemic species (Diong 1982). A stomach content analysis in this study showed that the pigs' food sources consisted of native plants, 60 percent of which were *Cibotium* spp. (tree ferns), alternating with *Psidium cattleianum* (strawberry guava) when it was available. Pigs were observed to fell plants and remove the bark of *Clermontia*, *Cibotium*, *Coprosma*, *Psychotria*, and *Hedyotis* species, with larger trees killed over a few months of repeated feeding.

Because Hawaii's native plants evolved without any browsing or grazing mammals present, many lost or never developed natural defenses to such impacts (Carlquist 1980; Lamoureux 1994). Browsing by ungulates has been observed on many other native species, including common and rare or endangered species (Diong 1982; Cuddihy and Stone 1990; Loope *et al*. 1991). Therefore, even though there are no observations of browsing on *Geranium hanaense*, it is likely that pigs impact this species directly as well as the surrounding habitat.

D. The inadequacy of existing regulatory mechanisms.
Geranium hanaense currently receives no protection under Hawaii's endangered species law (HRS, Sect. 195-D) or the Federal Endangered Species Act (16 U.S.C. §1531-1544).

E. Other natural or manmade factors affecting its continued existence.
Geranium hanaense is threatened by alien plant species that degrade and destroy habitat and outcompete native plants (Medeiros and St. John 1988; Medeiros *et al*. 1998; R. Hobdy, Division

of Forestry and Wildlife, pers. comm. 1999). Of the nonnative plant species present at the bogs where *G. hanaense* occurs, *Holcus lanatus* (velvetgrass), *Juncus planifolius*, and *Sacciolepis indica* showed the greatest increase in cover and frequency from 1982 through 1988, posing the greatest threat to *G. hanaense* at that time (Medeiros *et al*. 1991). Currently, the greatest threat is now posed by habitat degradation and destruction, and competition by the nonnative plants *Andropogon virginicus* (broomsedge), *Holcus lanatus* and *Tibouchina herbacea* (glorybush) (Medeiros *et al*. 1998).

Holcus lanatus, a grass native to Europe, is naturalized in Hawaii and occurs on poor, moist soils. This grass is an aggressive weed, growing rapidly from basal shoots or prolific seed and therefore can become dominant if not controlled. Velvetgrass gradually forces other plants out, reducing species diversity. Allelopathy may also play a role in the dominance of velvetgrass over other grasses. This grass is one of the most common nonnative plant species in the moist upland ecosystems of east Maui (Medeiros *et al*. 1998). It is present in the bogs on the northeast rift of Haleakala, especially in the areas rooted by feral pigs (Medeiros *et al*. 1998). The most effective control measure is physical removal by hand-pulling or hoeing. No safe, effective means of biocontrol have been found (Pitcher and Russo 2005).

Andropogon virginicus is a perennial bunchgrass native to northeastern America, now naturalized on Kauai, Maui, Oahu, and Hawaii along roadsides and in disturbed dry to mesic forest and shrubland (O'Connor 1999). This species was first observed at the northeast rift zone of Haleakala in 1986 (Medeiros *et al*. 1998). Seeds are easily distributed by wind, clothing, vehicles, and feral animals (Smith 1989). *Andropogon virginicus* may release allelopathic substances that dramatically decrease native plant reestablishment (Rice 1972). Natural enemies that may be used as biocontrol agents of this grass are known, but their introduction to Hawaii may not be possible as this grass is closely related to the commercially grown sugar cane (Smith 1985). In Mid-Camp Bog and Big Bog it continues to persist despite manual control efforts and remains a serious threat (Medeiros *et al*. 1998).

Tibouchina herbacea, a member of the Melastomataceae family, is native to southern Brazil, Uruguay, and Paraguay. In Hawaii, it is naturalized and abundant in disturbed mesic to wet forest on the islands of Hawaii, Maui, and Lanai (Wagner *et al*. 1999a). It was first recorded in Haleakala National Park in 1988 and is removed whenever it is found (Medeiros *et al*. 1998). It forms dense thickets, crowding out all other plant species and inhibiting regeneration of native plants (The Nature Conservancy 2003). All members of this genus are legally declared noxious in the state of Hawaii (Hawaii Administrative Rules Title 4, Subtitle 6, Chapter 68). Research is ongoing for biological controls of this species (Smith 1998; The Nature Conservancy 2003).

The original native flora of Hawaii consisted of about 1,400 species, nearly 90 percent of which were endemic. Of the current total native and naturalized Hawaiian flora of 1,817 taxa, 47 percent are introduced species, and nearly 100 species are pests (Smith 1985; Wagner *et al*. 1999a). Confirmed direct observations (Medeiros *et al*. 1991; Loope *et al*. 1991) and several studies (Cuddihy and Stone 1990; Wood and Perlman 1997; Robichaux *et al*. 1998) indicate nonnative plant species may outcompete native plants similar to *Geranium hanaense*. Competition may be for space, light, water, or nutrients, or there may be a chemical produced

that inhibits growth of other plants (Smith 1985; Cuddihy and Stone 1990). In addition, nonnative pest plants found in the bog habitat of *G. hanaense* and other similar habitats have been shown to make the habitat less suitable for native species (Smathers and Gardner 1978; Smith 1985; Loope and Medeiros 1992; Medeiros *et al*. 1992; Ellshoff *et al*. 1995; Meyer and Florence 1996; Medeiros *et al*. 1997, Loope *et al*. 2004). In particular, alien pest plant species degrade habitat by modifying availability of light, altering soil-water regimes, modifying nutrient cycling, or altering fire characteristics of native plant communities (Smith 1985; Cuddihy and Stone 1990; Vitousek *et al*. 1997). Because of demonstrated habitat modification and resource competition by nonnative plant species in the bog habitat of *G. hanaense*, the Service believes nonnative plant species are a threat to *G. hanaense*.

With only two known locations immediately adjacent to one another and restricted to a very small area, extinction from randomly occurring natural events is also a major threat. Species like *Geranium hanaense* that are endemic to single small islands are inherently more vulnerable to extinction than widespread species because of the higher risks posed to a single population by genetic bottlenecks, random demographic fluctuations, and localized catastrophes such as hurricanes (Pimm *et al*. 1988; Mangel and Tier 1994). While this species may have always been low in numbers, historically it did not have to compete with alien plant species and its habitat was not degraded by ungulates and alien plant species.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

As a result of parallel studies on the effects of activities of feral pigs and nonnative plants on the bogs of the northeast rift of Haleakala in the 1980s, Big Bog was fenced in 1987, and Mid-Camp Bog was fenced in 1988, to provide protection to rare and endangered plants (Medeiros *et al*. 1991). The National Park Service is implementing nonnative plant species control in these fenced areas and monitors the fences for damage or ingress by feral pigs (Aruch 2006).

SUMMARY OF THREATS

Based on our evaluation of habitat degradation and loss by feral pigs and nonnative plants, we conclude there is sufficient information to develop a proposed rule for this species due to the present and threatened destruction, modification, or curtailment of its habitat and range, and the displacement of individuals of *Geranium hanaense*, due to competition with nonnative plants for space, nutrients, water, air, and light. Predation by feral pigs and small population size are likely threats to this species. Even with fencing and monitoring, *Geranium hanaense* is not recovering and continues to decline (K. Wood, pers comm. 2005). We find that this species is warranted for listing throughout all its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

RECOMMENDED CONSERVATION MEASURES

- Survey for populations of *Geranium hanaense* in areas of potentially suitable habitat
- Continue control of feral pigs
- Continue control of alien plants
- Begin propagation efforts for maintenance of genetic stock
- Reintroduce individuals into suitable habitat within historic range that is being managed

for known threats to this species

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	**Imminent**	Monotypic genus	7
		Species	**8***
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:
This species is threatened by feral pig activity and nonnative plants that outcompete and displace it. The National Park Service (NPS) fenced the two bogs in which this species is currently known to occur, thus minimizing the effects of feral pigs. The fences must be routinely monitored and maintained to ensure that the bogs remain pig-free. Similarly, NPS has an ongoing program of nonnative plant removal form the bogs. Given that the threats to the only known populations of this species are currently being managed and the populations are routinely monitored, the overall magnitude of these threats is moderate.

Immediacy of Threats:
The threats to *Geranium hanaense* from nonnative plants is imminent because, even though the bogs in which all individuals are currently found are fenced and nonnative plant management is ongoing, the nonnative plants must continually be controlled.

Rationale for Change in Listing Priority Number:
The threats are imminent but the magnitude of threats is considered moderate rather than high, for reasons discussed above. As a species with imminent threats of moderate magnitude, *Geranium hanaense* warrants a LPN of 8, rather than the previously assigned LPN of 5.

Yes Have you promptly reviewed all of the information received regarding the species for

the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. The species does not appear to be appropriate for emergency listing at this time because the immediacy of the threats is not so great as to imperil a significant proportion of the taxon within the time frame of the routine listing process. In addition, feral pigs have been fenced out of the bogs in which this species occurs, and control of nonnative plants is ongoing in the fenced areas. If it becomes apparent that the routine listing process is not sufficient to prevent further losses that may result in this subspecies' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of *Geranium hanaense* as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

DESCRIPTION OF MONITORING

The information in this form is based on the results of a meeting of 20 botanical experts held by the Center for Plant Conservation in December 1995, and was updated by personal communication with Robert Hobdy of the Division of Forestry and Wildlife in 1999. We incorporated additional new information on this species from information in our files and from the *Manual of the Flowering Plants of Hawaii* (Wagner *et al*. 1999a). In 2004, the Pacific Islands Office contacted the following species experts: Robert Hobdy, retired from the Hawaii Division of Forestry and Wildlife; Joel Lau, Hawaii Natural Heritage Program; Arthur Medeiros, U.S.G.S. Biological Resources Discipline; Hank Oppenheimer, resource manager for the Maui Land and Pineapple Company; and Steve Perlman and Ken Wood, National Tropical Botanical Garden. No new information on status or range of *Geranium hanaense* was provided. In 2005 we contacted species experts and confirmation of the status of *G. hanaense* was provided by Ken Wood of the National Tropical Botanical Garden. In 2006, the Pacific Islands Office contacted the species experts listed below, but no new status or range information was provided on this taxon.

List all experts contacted:

Name	Date	Affiliation
Abbott, Lyman	08/11/06	Kahoolawe Island Reserve Commission
Agorastos, Nick	08/11/06	Hawaii Division of Forestry and Wildlife
Aruch, Sam	08/11/06	The Nature Conservancy
Bakutis, Ane	08/11/06	Plant Extinction Prevention Program
Bartlett, Randy	08/15/06	Maui Land and Pineapple Company
Belfield, Thomas	08/15/06	National Park Service
Bender, David	08/11/06	National Tropical Botanical Garden
Burney, David	08/11/06	National Tropical Botanical Garden
Caraway, Vickie	09/13/06	Hawaii Division of Forestry and Wildlife
Cassel, Katie	08/11/06	Kokee Resource Conservation Program
Chimera, Chuck	08/11/06	National Park Service
Clark, Michelle	08/11/06	Natural Resources Conservation Service
Cordell, Susan	08/11/06	U.S. Forestry Service

Denslow, Julie	08/11/06	U.S. Forestry Service
Drake, Don	08/11/06	University of Hawaii
Duvall, Fern	08/11/06	Hawaii Division of Forestry and Wildlife
Gagne, Betsy	08/11/06	Hawaii Division of Forestry and Wildlife
Garnett, Bill	08/11/06	National Park Service, Kalaupapa
Giffin, Jon	08/11/06	The Nature Conservancy
Gon, Sam	08/11/06	The Nature Conservancy
Hadway, Lisa	08/11/06	Hawaii Division of Forestry and Wildlife
Higashino, Paul	08/11/06	Kahoolawe Island Reserve Commission
Hobdy, Robert	08/11/06	Retired, HI Division of Forestry & Wildlife
Hoffman, Nancy	09/12/06	U.S. Fish and Wildlife Service, Refuges
Hughes, Guy	08/11/06	National Park Service
Imada, Clyde	08/11/06	Bishop Museum
Jacobi, Jim	08/11/06	U.S. Geological Survey
Jeffrey, Jack	08/11/06	U.S. Fish and Wildlife Service, Refuges
Kaufman, J. Boone	08/11/06	U.S. Forestry Service
Kawakami, Galen	08/08/06	Hawaii Division of Forestry and Wildlife
Kawelo, Kapua	08/11/06	U.S. Army, Environmental Division
Kiyabu, Brian	08/11/06	Amy Greenwell Botanical Garden
Koob, Gregory	08/11/06	Natural Resources Conservation Service
Lau, Joel	08/11/06	Hawaii Biodiversity and Mapping Program
Liesemeyer, Brent	08/11/06	Hawaii Division of Forestry and Wildlife
Loh, Rhonda	08/11/06	National Park Service
Loope, Lloyd	08/11/06	U.S. Geological Survey
Medeiros, Arthur	08/11/06	U.S. Geological Survey
Menard, Trae	08/11/06	The Nature Conservancy
Misaki, Ed	08/11/06	The Nature Conservancy
Morden, Cliff	08/11/06	University of Hawaii
Moses, Wailana	08/11/06	The Nature Conservancy
Naboa, Eldridge	08/11/06	The Nature Conservancy
Nakai, Glynnis	08/11/06	U.S. Fish and Wildlife Service
Oppenheimer, Hank	08/11/06	Plant Extinction Prevention Program
Palmer, Dan	08/11/06	amateur pteridologist
Pelizza, Sylvia	08/11/06	U.S. Fish and Wildlife Service, Refuges
Perlman, Steve	08/11/06	National Tropical Botanical Garden
Perry, Lyman	08/11/06	Hawaii Division of Forestry and Wildlife
Pratt, Linda	08/11/06	U.S. Geological Survey
Rehkemper, Cindy	06/06/06	U.S. Fish and Wildlife Service, Refuges
Rivers, Julie	09/12/06	U.S. Navy, Environmental Division
Ryder, Micah	08/11/06	Koolau Mountains Watershed Partnership
Sailer, Dan	08/11/06	The Nature Conservancy
Scowcroft, Paul	08/11/06	U.S. Forestry Service
Seidman, Stephanie	07/25/06	Maui Nui Botanical Gardens
Starr, Forest	08/11/06	U.S. Geological Survey
Sugii, Nellie	08/30/06	Lyon Arboretum

Tangalin, Natalia	05/24/06	National Tropical Botanical Garden
Warshauer, Rick	08/11/06	U.S. Geological Survey
Wass, Richard	08/11/06	U.S. Fish and Wildlife Service, Refuges
Welton, Patti	12/13/06	National Park Service
Whitehead, Namaka	08/11/06	Kamehameha Schools
Wood, Ken	08/11/06	National Tropical Botanical Garden
Yoshiokia, Joan	08/11/06	National Park Service

The Hawaii Biodiversity and Mapping Program identified this species as critically imperiled (HBMP 2006b). Based on the International Union for Conservation of Nature and Natural Resources Red Plant Data Book rarity categories, this subspecies is recognized as Rare (could be considered at risk) by Wagner *et al*. (1999b). *Geranium hanaense* not included in the list of species in Hawaii's 2005 Comprehensive Wildlife Conservation Strategy (Mitchell *et al*. 2005).

COORDINATION WITH STATES

In September 2006 we provided the Hawaii Division of Forestry and Wildlife with copies of our most recent candidate assessments for their review and comment. Vickie Caraway, the State botanist, reviewed the information for this species and provided no additional information or corrections (V. Caraway, Division of Forestry and Wildlife, pers. comm. 2006).

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Personal Communications

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Wood, K. National Tropical Botanical Garden, Response to request for candidate plant species information, June 28, 2005.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____ 6/1/07
Regional Director, Fish and Wildlife Service Date

Concur: _____ November 27, 2007
Acting Director, U.S. Fish and Wildlife Service Date

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review: Date: March 30, 2007
Conducted by: Cheryl Phillipson, Pacific Islands FWO
Biologist, Prelisting and Listing Program

Comments:
PIFWO Review

Reviewed by: Karen Rosa for Christa Russell Date: March 30, 2007
Prelisting and Listing Program Coordinator

Gina Shultz Date: March 30, 2007
Assistant Field Supervisor,
Endangered Species

Patrick Leonard Date: March 30, 2007

Field Supervisor